

AIR QUALITY PERMIT

Issued To:	Encore Energy Partners Operating, LLC Elk Basin Tensleep Battery No. 2 & Madison No. 9 777 Main Street, Suite 1400 Fort Worth, TX 76102	Permit: #3300-02 Administrative Amendment (AA) Request Received: 04/19/07 Department Decision on AA: 08/22/07 Permit Final: 09/07/07 AFS #: 009-0006
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A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Encore Energy Partners Operating, LLC (Encore), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

SECTION I: Permitted Facilities

A. Plant Location

The Elk Basin Tensleep Battery No. 2 and Madison Battery No. 9 facility is located approximately 3.5 miles Northwest of Elk Basin, Wyoming, in Section 35, Township 9 South, Range 23 East, in Carbon County, Montana.

B. Current Permit Action

On April 16, 2007, and April 19, 2007, the Montana Department of Environmental Quality – Air Resources Management Bureau (Department) received written notification from Encore and Howell Petroleum Corporation (Howell), respectively, informing the Department of Howell's intent to transfer MAQP #3300-01 from Howell to Encore. The current permit action transfers the MAQP from Howell to Encore.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. Encore shall limit the production through the 1,000 barrel (bbl) working oil tank (1-OT) to 292,000 bbls during any rolling 12-month time period (ARM 17.8.749).
2. Encore shall limit the production through the 1,000 bbl working oil tank (6-OT) to 164,250 bbls during any rolling 12-month time period (ARM 17.8.749).
3. Encore shall limit the volume of gas exiting the 1,000 bbl bad oil tank (2-BT) to 708,333 standard cubic feet (Scf) during any rolling 12-month time period (ARM 17.8.749 and ARM 17.8.1204).
4. Encore shall limit the volume of gas routed to the emergency flare pit (5-EF) to 4.42 million standard cubic feet (MMScf) of gas flaring during any rolling 12-month time period (ARM 17.8.749).
5. Encore shall limit the volume of gas exiting the 300 bbl emergency pop tank (11-PT) to 2.28 MMScf during any rolling 12-month time period (ARM 17.8.749 and ARM 17.8.1204).

6. Gas venting through the 1,000 bbl bad oil tank (2-BT) and the emergency 300 bbl pop tank (11-PT), and flaring of gas through the emergency flare pit (5-EF) shall only occur during emergency/non-routine operations (ARM 17.8.752).
7. Encore shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed on or before November 23, 1968, that exhibit an opacity of 40% or greater averaged over 6 consecutive minutes (ARM 17.8.304).
8. Encore shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).
9. Encore shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).
10. Encore shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.9 (ARM 17.8.749).

B. Inspection and Repair Requirements

1. Each calendar month, all fugitive piping components (valves, flanges, pump seals, open-ended lines) shall be inspected for leaks. For purposes of this requirement, detection methods incorporating sight, sound, or smell are acceptable (ARM 17.8.752).
2. Encore shall (ARM 17.8.105 and ARM 17.8.752):
 - a. Make a first attempt at repair for any leak not later than 5 calendar days after the leak is detected; and
 - b. Repair any leak as soon as practicable, but no later than 15 calendar days after it is detected, except as provided in Section II.B.3.
3. Delay of repair of equipment for which a leak has been detected will be allowed if repair is technically infeasible without a source shutdown. Such equipment shall be repaired before the end of the first source shutdown after detection of the leak (ARM 17.8.752).

C. Operational Reporting Requirements

1. Encore shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with MAQP limitations (ARM 17.8.505).

2. Encore shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).
3. Encore shall document, by month, the production of the 1,000 bbl working oil tank (1-OT). By the 25th day of each month, Encore shall total the production of the 1,000 bbl working oil tank (1-OT) during the previous 12 months for use in verifying compliance with the limitation in Section II.A.1. The information for each of the previous 12 months shall be submitted along with the annual emission inventory (ARM 17.8.749).
4. Encore shall document, by month, the production of the 1,000 bbl working oil tank (6-OT). By the 25th day of each month, Encore shall total the production of the 1,000 bbl working oil tank (6-OT) during the previous 12 months for use in verifying compliance with the limitation in Section II.A.2. The information for each of the previous 12 months shall be submitted along with the annual emission inventory (ARM 17.8.749).
5. Encore shall document, by month, the volume of gas routed to the 1,000 bbl bad oil tank (2-BT). By the 25th day of each month, Encore shall total the amount of gas routed to the 1,000 bbl bad oil tank (2-BT) during the previous 12 months for use in verifying compliance with the limitation in Section II.A.3. The information for each of the previous 12 months shall be submitted along with the annual emission inventory (ARM 17.8.749).
6. Encore shall document, by month, the volume of gas routed to the emergency flare pit (5-EF). By the 25th day of each month, Encore shall total the volume of gas routed to the emergency flare pit (5-EF) during the previous 12 months for use in verifying compliance with the limitation in Section II.A.4. The information for each of the previous 12 months shall be submitted along with the annual emission inventory (ARM 17.8.749).
7. Encore shall document, by month, the volume of gas routed to the 300 bbl emergency pop tank (11-PT). By the 25th day of each month, Encore shall total the volume of gas routed to the emergency pop tank (11-PT) during the previous 12 months for use in verifying compliance with the limitation in Section II.A.5. The information for each of the previous 12 months shall be submitted along with the annual emission inventory (ARM 17.8.749).

8. Encore shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204(3)(b). The annual certification shall comply with the certification requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emission inventory information (ARM 17.8.1204).

D. Recordkeeping Requirements

1. A record of each monthly leak inspection required by Section II.B.1 of this MAQP shall be kept on file with Encore. Inspection records shall include, at a minimum, the following information (ARM 17.8.749):
 - a. Date of inspection;
 - b. Findings (may indicate no leaks discovered or location, nature, and severity of each leak);
 - c. Leak determination method;
 - d. Corrective action (date each leak repaired and reasons for any repair interval in excess of 15 calendar days); and
 - e. Inspector's name and signature.
2. Encore shall maintain a record of the date and the reason that gas was either vented through the 1,000 bbl bad oil tank (2-BT), vented through the emergency 300 bbl pop tank (11-PT), or flared through the emergency flare to demonstrate compliance with Section II.A. 6 (ARM 17.8.749).
3. All records compiled in accordance with this permit must be maintained by Encore as a permanent business record for at least 5 years following the date of the measurement, must be available for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

E. Testing Requirements

1. The Department may require testing (ARM 17.8.105).
2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

SECTION III: General Conditions

- A. Inspection – Encore shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this MAQP.
- B. Waiver – The MAQP and the terms, conditions, and matters stated herein shall be deemed accepted if Encore fails to appeal as indicated below.

- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Encore of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for MAQP revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefor, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on an MAQP by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the MAQP shall be made available for inspection by the Department at the location of the source.
- G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Encore may be grounds for revocation of this MAQP, as required by that section and rules adopted thereunder by the Board.

Permit Analysis
Encore Energy Partners Operating, LLC
Elk Basin Tensleep Battery No. 2 & Madison No. 9
Permit #3300-02

I. Introduction/Process Description

Encore Energy Partners Operating, LLC (Encore) owns and operates 2 oil and gas production batteries located approximately 3.5 miles Northwest of Elk Basin, Wyoming, in Section 35, Township 9 South, Range 23 East, in Carbon County, Montana. The batteries are known as the Elk Basin Tensleep Battery No. 2 and the Madison Battery No. 9.

A. Permitted Equipment

The facility consists of the following equipment:

Source I.D.	Description	Year Constructed	Battery
1-OT	1000-bbl Working Oil Tank	Before 11/23/68	Battery #2
2-BT	1000-bbl Bad Oil Tank	Before 11/23/68	Battery #2
3-HT	1.35 MMBtu/hr Heater Treater	Before 11/23/68	Battery #2
4-HT	2.5 MMBtu/hr Heater Treater	Before 11/23/68	Battery #2
5-EF	Emergency Flare Pit	Before 11/23/68	Battery #2
6-OT	1000-bbl Working Oil Tank	Before 11/23/68	Battery #9
7-BT	1000-bbl Bad Oil Tank	Before 11/23/68	Battery #9
8-HT	1.35 MMBtu/hr Heater Treater	Before 11/23/68	Battery #9
9-HT	1.35 MMBtu/hr Heater Treater	Before 11/23/68	Battery #9
11-PT	300-bbl Pop Tank	Before 11/23/68	Battery #9
12-FE	Fugitive Emissions	N/A	Battery #2 & #9
13-PD	Fugitive Emissions (Pneumatic Devices)	N/A	Battery #2 & #9

*barrels (bbl)

** Million British thermal units per hour (MMBtu/hr)

B. Source Description

The Elk Basin Tensleep Battery No. 2 and Madison Battery No. 9 are located on contiguous and adjacent properties within the same facility boundary, both batteries are owned and operated by Encore, and both batteries share the same control equipment (vapor recovery unit). Therefore, in accordance with the Administrative Rules of Montana (ARM) 17.8.740(6), the two batteries meet the definition of a facility and Howell Petroleum Corporation (Howell) applied for one Montana Air Quality Permit (MAQP) for both batteries.

Elk Basin Tensleep Battery No. 2

Oil and natural gas from nearby wells is received through a header at this battery and the oil and gas is then routed through the heater treaters. The heater treaters separate the oil and gas. The oil is then routed to a 1000 barrel (bbl) working tank and the gas is routed to a gas separator to be sent to the Elk Basin Gas Plant, in Wyoming, via pipeline. Any fluids from the gas separator and/or the rejected oil from the lease operated custody transfer (LACT) unit are routed to a 1000 bbl bad oil tank. Water from the treaters is routed to an injection facility for water flood

operations. Oil from the storage tanks is sold via LACT units. An electric powered vapor recovery unit captures the vapors from the working tank and the vapors are routed to the Elk Basin Gas Plant via pipeline to be processed. Any pressure relief gas and any vapors from the oil storage tank are routed to the emergency flare and/or vented to the atmosphere through the bad oil tank during emergency/non-routine operations.

Madison Battery No. 9

Oil and natural gas from nearby wells is received through a header at this battery, and the oil and gas is then routed to a free-water knock out vessel to remove excess water. The oil and gas is then routed through heater treaters to separate the oil and gas. The oil is then routed to a 1000 bbl working tank and the gas is routed to a gas separator to be sent to the Elk Basin Gas Plant via pipeline. Any liquids from the gas separator and/or rejected oil from the LACT unit are routed to a 1000 bbl bad oil tank. Water from the free-water knockout vessel and the treaters is routed to an injection facility for water flood operations. Oil from the storage tanks is sold via LACT units. The same electric powered vapor recovery unit utilized by the Elk Basin Tensleep Battery No. 2 captures the vapors from the working tank and the vapors are routed to the Elk Basin Gas Plant via pipeline to be processed. Any pressure relief gas and any vapors from the oil storage tank are routed to the emergency flare and/or the atmosphere through the 300 bbl pop tank during emergency/non-routine operations.

C. Permit History

On March 4, 2004, the Montana Department of Environmental Quality – Air Resources Management Bureau (Department) received a complete MAQP application from Howell. The application was for the operation of the Elk Basin Tensleep Battery No. 2 and Madison Battery No. 9 facility. Both batteries were constructed prior to November 23, 1968; however, since 1968, new wells were drilled by both previous and current operators, which may have increased the facility's Potential to Emit (PTE) regulated air pollutants by more than 25 tons per year. Howell stated in MAQP Application #3300-00 that an accurate assessment of the actual increases caused by the post 1968 facility modifications (drilling of new wells) is difficult to determine due to the number of new wells drilled and the various operators during this time period. Therefore, Howell submitted a MAQP application to ensure compliance with ARM 17.8.743(1)(d). On June 2, 2004, MAQP **#3300-00** became final and effective.

On September 24, 2004, the Department received a complete MAQP application from Howell for the modification of MAQP #3300-00 to correct errors that were incorporated into MAQP #3300-00. Specifically, Howell requested that the Department:

- Correct the limit for gas exiting the 1,000 bbl bad oil tank (2-BT) to include the oil production flash gas stream;
- Use the specific gravity of the gas stream rather than the ideal gas factor to calculate Volatile Organic Compounds (VOC) emissions from the emergency flare pit (5-EF);
- Correct the limit for the gas exiting the 300 bbl emergency pop tank (11-PT) to include the oil production flash gas stream and remove the working and standing losses associated with the 300 bbl emergency pop tank because it does not store oil or condensate;
- Correct the VOC emissions from fugitive emission from piping (12-FE) to only include VOC emissions rather than total hydrocarbons; and
- Use the specific gravity of the fuel gas rather than the ideal gas factor to calculate fugitive emissions from pneumatic devices (13-PD).

This MAQP action incorporated Howell's requests into the MAQP. On November 19, 2004, MAQP **#3300-01** replaced MAQP #3300-00.

D. Current Permit Action

On April 16, 2007, and April 19, 2007, the Department received written notification from Encore and Howell, respectively, informing the Department of Howell's intent to transfer MAQP #3300-01 from Howell to Encore. The current permit action transfers the MAQP from Howell to Encore. MAQP #3300-02 replaces MAQP #3300-01.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the MAQP.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the ARM and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

Encore shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.
5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM₁₀

Encore must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Encore shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.
4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.
6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.
7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS affected source because it does not meet the definition of any NSPS subpart defined in 40 CFR Part 60.

40 CFR 60, Subpart K – Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstructions, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978, does not apply because the facility was constructed prior to June 11, 1973. In addition, this subpart does not apply to storage vessels for petroleum or condensate stored, processed, or treated at production facilities prior to custody transfer.

40 CFR 60 Subpart Ka – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after May 18, 1978, and prior to July 23, 1984, does not apply because the tanks were constructed prior to May 18, 1978. In addition, each petroleum liquid storage vessel with a capacity of less than 420,000 gallons used for petroleum or condensate stored, processed, or treated prior to custody transfer is exempt from the requirements of this subpart.

40 CFR 60, Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, is not applicable to any of the tanks at the facility because the tanks were constructed prior to July 23, 1984. In addition, this subpart does not apply to vessels with a design capacity less than or equal to 1,589,874 cubic meters (m³) used for petroleum or condensate stored, processed, or treated prior to custody transfer.

8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR 63, National Emission Standards for Hazardous Air Pollutants (NESHAP).

40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities. Owners or operators of oil and natural gas production facilities, as defined and applied in 40 CFR Part 63, shall comply with the applicable provisions of 40 CFR Part 63, Subpart HH. In order for an oil and natural gas production facility to be subject to 40 CFR Part 63, Subpart HH requirements, certain criteria must be met. First, the facility must be a major source of Hazardous Air Pollutants (HAP) as determined according to paragraphs (a)(1)(i) through (a)(1)(iii) of 40 CFR 63, Subpart HH. Second, a facility that is determined to be major for HAPs must also either process, upgrade, or store hydrocarbon liquids prior to the point of custody transfer, or process, upgrade, or store natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user. Third, the facility must also contain an affected source as specified in paragraphs (b)(1) through (b)(4) of 40 CFR Part 63, Subpart HH. Finally, if the first three criteria are met, and the exemptions contained in paragraphs (e)(1) and (e)(2) of 40 CFR Part 63, Subpart HH do not apply, the facility is subject to the applicable provisions of 40 CFR Part 63, Subpart HH. Based on the information submitted by Encore, the Elk Basin Tensleep Battery #2 & Madison Battery #9 facility is not subject to the provisions of 40 CFR Part 63, Subpart HH because the facility is not a major source of HAPs.

- D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an MAQP application fee concurrent with the submittal of an MAQP application. An MAQP application is incomplete until the proper application fee is paid to the Department. Encore was not required to submit an MAQP application fee because the current MAQP action is considered an administrative action.
2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an MAQP (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an MAQP application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final MAQP issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an MAQP or MAQP modification to construct, modify or use any air contaminant sources that have the PTE greater than 25 tons per year of any pollutant. The Encore facility was constructed and operating prior to November 23, 1968. However, the drilling of new wells that occurred after November 23, 1968, represents a change in the method of operation (higher throughput through the production tanks) that increased the facility's PTE Volatile Organic Compounds (VOC) by more than 25 tons per year. Therefore, Encore has the potential to emit more than 25 tons per year of VOC and an MAQP is required.
3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the MAQP program.
4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require an MAQP under the MAQP Program.
5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that an MAQP application be submitted prior to installation, alteration, or use of a source. Encore was not required to submit an MAQP application because the current permitting action is an administrative action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for an MAQP. Encore was not required to submit an affidavit of public notice because the current permitting action is an administrative action.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the MAQP's issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the MAQP and the requirements of this subchapter. This rule also requires that the MAQP must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
 7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.
 8. ARM 17.8.755 Inspection of Permit. This rule requires that MAQP's shall be made available for inspection by the Department at the location of the source.
 9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the MAQP shall be construed as relieving Encore of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
 10. ARM 17.8.762 Duration of Permit. An MAQP shall be valid until revoked or modified, as provided in this subchapter, except that an MAQP issued prior to construction of a new or altered source may contain a condition providing that the MAQP will expire unless construction is commenced within the time specified in the MAQP, which in no event may be less than 1 year after the MAQP is issued.
 11. ARM 17.8.763 Revocation of Permit. An MAQP may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
 12. ARM 17.8.764 Administrative Amendment to Permit. An MAQP may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond MAQP limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring an MAQP, or unless the owner or operator applies for and receives another MAQP in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
 13. ARM 17.8.765 Transfer of Permit. This rule states that an MAQP may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.
- F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:
1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:
 - a. PTE greater than ($>$) 100 tons per year of any pollutant;
 - b. PTE $>$ 10 tons per year of any one hazardous air pollutant (HAP), PTE $>$ 25 tons per year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
 - c. PTE $>$ 70 tons per year of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) in a serious PM_{10} nonattainment area.
2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #3300-02 for Encore, the following conclusions were made:
 - a. The facility's PTE is less than ($<$) 100 tons per year for any pollutant;
 - b. The facility's PTE is $<$ 10 tons per year for any one HAP and $<$ 25 tons per year for all HAPs;
 - c. This source is not located in a serious PM_{10} nonattainment area;
 - d. This facility is not subject to any current NSPS;
 - e. This facility is not subject to any current NESHAP standards;
 - f. This source is neither a Title IV affected source, nor a solid waste combustion unit; and
 - g. This source is not an EPA designated Title V source.
 - h. As allowed by ARM 17.8.1204(3), the Department may exempt a source from the requirement to obtain an air quality operating permit by establishing federally enforceable limitations which limit that source's PTE.
 - i. In applying for an exemption under this section, the owner or operator of the source shall certify to the Department that the source's PTE, does not require the source to obtain an air quality operating permit.

- ii. Any source that obtains a federally enforceable limit on PTE shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit.

Encore has taken federally enforceable MAQP limits to keep potential emissions below major source permitting thresholds. Therefore, the facility is not a major source and a Title V operating permit is not required.

The Department determined that the annual reporting requirements contained in the MAQP are sufficient to satisfy this requirement.

3. ARM 17.8.1207 Certification of Truth, Accuracy, and Completeness.

Encore shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204 (3)(b). The annual certification shall comply with requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emission inventory information.

Based on these facts, the Department determined that Encore will be a minor source of emissions as defined under Title V.

III. BACT Determination

A BACT determination is required for each new or altered source. Encore shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized. A BACT analysis was not required for the current permitting action because it is considered an administrative action.

IV. Emission Inventory

Source I.D.#	Source	Tons/year						
		PM	NO _x	CO	VOC	SO _x	HAPs	H ₂ S
1-OT	1000-bbl Working Oil Tank	-----	-----	-----	6.75	-----	0.01	0.90
2-BT	1000-bbl Bad Oil Tank	-----	-----	-----	18.27	-----	0.02	3.48
3-HT	1.35 MMBtu/hr Heater Treater	0.09	1.14	0.96	0.06	0.01	0.02	-----
4-HT	2.5 MMBtu/hr Heater Treater	0.16	2.11	1.77	0.12	0.01	0.04	-----
5-EF	Emergency Flare Pit	0.02	0.34	0.68	0.88	48.73	0.00	0.37
6-OT	1000-bbl Working Oil Tank	-----	-----	-----	12.33	-----	0.01	0.19
7-BT	1000-bbl Bad Oil Tank	-----	-----	-----	0.50	-----	0.00	-----
8-HT	1.35 MMBtu/hr Heater Treater	0.09	1.14	0.96	0.06	0.01	0.02	-----
9-HT	1.35 MMBtu/hr Heater Treater	0.09	1.14	0.96	0.06	0.01	0.02	-----
11-PT	300-bbl Pop Tank	-----	-----	-----	51.01	-----	0.03	2.88
12-FE	Fugitive Emissions (Piping)	-----	-----	-----	4.21	-----	0.45	0.57
13-PD	Fugitive Emissions (Pneumatic Devices)	-----	-----	-----	0.49	-----	0.00	-----
Totals		0.45	5.87	5.33	94.74	48.77	0.62	8.39

1,000-bbl Working Oil Tank (1-OT)

Permit Limitation – 800 bbl/day

(Requested by Company)

Control efficiency estimated to be 98% for Vapor Recovery Unit

(Company Information)

VOC Emissions:

Standing and working losses

VOC Emission Rate: 7,063.06 lb/yr (EPA Tanks Emission Estimation Program v. 4.0)
 $7,063.06 \text{ lb/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.07 \text{ ton/yr}$

Flashing losses

VOC Emission Rate: 76.22 lb/hr (HYSIS Flash Emission Estimation Program v.3.1)
 $76.22 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 6.68 \text{ ton/yr}$

Total losses = 0.07 ton/yr + 6.68 ton/yr = 6.75 ton/yr

HAP Emissions:

Standing and working losses

HAP Emission Rate: 0.001 lb/hr (HYSIS Flash Emission Estimation Program v.3.1)
 $0.001 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.0001$

Flashing losses = $0.07 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.0061 \text{ ton/yr}$

Total losses = 0.0001 ton/yr + 0.0061 ton/yr = 0.01 ton/yr

H₂S Emissions

H₂S Emission Rate: 10.33 lb/hr (HYSIS Flash Emission Estimation Program V.3.1)
 $10.33 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.90$

1,000-bbl Bad Oil Tank (2-BT)

VOC Emissions:

Standing and working losses

VOC Emission Rate: 1,005.23 lb/yr (EPA Tanks Emission Estimation Program v. 4.0)
 $1,005.23 \text{ lb/yr} * 0.0005 \text{ ton/lb} = 0.50 \text{ ton/yr}$

Emergency Venting

Production Vessels Gas Stream

Gas Volume: 10000 Scf/day or 417 Scf/hr (Company Information)
Gas Specific Gravity: 1.12 (Company Information)
Hours of Operation: 500 hr/yr (Requested to limit VOC below 100 ton/yr)
Density of Air: 0.078 lb/Scf (average of at STP and 59° F)
VOC Weight %: 25.46 (Gas Analysis)

Calculations: $417 \text{ Scf/hr} * 0.078 \text{ lb/Scf} * 1.12 = 36.43 \text{ lb/hr}$
 $36.43 \text{ lb/hr} * 500 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 9.11 \text{ ton/year}$
 $9.11 \text{ ton/year} * 25.46 / 100 = 2.32 \text{ ton/yr}$

Oil Production Flash Gas Stream

Gas Volume: 24,000 Scf/day or 1,000 Scf/hr (Company Information)
Gas Specific Gravity: 1.256 (Company Information)
Hours of Operation: 500 hr/yr (Requested to limit VOC below 100 ton/yr)
Density of Air: 0.078 lb/Scf (average of at STP and 59° F)
VOC Weight %: 63.10 (HYSIS Flash Emission Estimation Program V.3.1)

Calculations: $1000 \text{ Scf/hr} * 0.078 \text{ lb/Scf} * 1.256 = 97.97 \text{ lb/hr}$
 $97.97 \text{ lb/hr} * 500 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 24.49 \text{ ton/year}$
 $24.49 \text{ ton/year} * 63.10 / 100 = 15.45 \text{ ton/yr}$

Total losses = $0.50 \text{ ton/yr} + 2.32 \text{ ton/yr} + 15.45 = 18.27$

HAP Emissions:

Standing and working losses

HAP Emission Rate: 0.00 lb/yr (Gas Analysis)

Emergency Venting

Production Vessels Gas Stream

HAP Emission Rate: 0.00 lb/yr (Gas Analysis)

Oil Production Flash Gas Stream

Gas Volume: 24,000 Scf/day or 1,000 Scf/hr (Company Information)
Gas Specific Gravity: 1.256 (Company Information)
Hours of Operation: 500 hr/yr (Requested to limit VOC below 100 ton/yr)
Density of Air: 0.078 lb/Scf (average of at STP and 59° F)
HAP Weight %: 0.07 (HYSIS Flash Emission Estimation Program V.3.1)

Calculations: $1000 \text{ Scf/hr} * 0.078 \text{ lb/Scf} * 1.256 = 97.97 \text{ lb/hr}$
 $97.97 \text{ lb/hr} * 500 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 24.49 \text{ ton/yr}$
 $24.49 \text{ ton/year} * 0.07 / 100 = 0.02 \text{ ton/yr}$

Total losses = 0.00 ton/yr + 0.00 ton/yr + 0.02 ton/yr = 0.02 ton/yr

H₂S Emissions

Emergency Venting

Production Vessels Gas Stream

H₂S Emission Rate: 5.55 lb/hr (Gas Analysis)
5.55 lb/hr * 500 hr/yr * 0.0005 ton/lb = 1.38 ton/yr

Oil Production Flash Gas Stream

H₂S Emission Rate 8.38 lb/hr (HYSIS Flash Emission Estimation Program V.3.1)
8.38 lb/hr * 500 hr/yr * 0.0005 ton/lb = 2.10 ton/yr

Total Losses = 1.38 ton/yr + 2.10 ton/yr = 3.48 ton/yr

(3) 1.35 MMBtu/hr Heater Treaters (3-HT, 8-HT, and 9-HT)

Fuel Consumption: 1.35 MMBtu/hr
Fuel Heating Value: 520 MMBtu/MMScf

PM Emissions (PM emissions include PM₁₀ and PM_{2.5}):

Emission Factor: 7.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Calculations: 7.6 lb/MMScf * 1 MMScf/520 MMBtu * 1.35 MMBtu/hr = 0.02 lb/hr
0.02 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.09 ton/yr

NO_x Emissions:

Emission Factor: 100 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Calculations: 100 lb/MMScf * 1 MMScf/520 MMBtu * 1.35 MMBtu/hr = 0.26 lb/hr
0.26 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 1.14 ton/yr

CO Emissions:

Emission Factor: 84 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Calculations: 84 lb/MMScf * 1 MMScf/520 MMBtu * 1.35 MMBtu/hr = 0.22 lb/hr
0.22 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.96 ton/yr

VOC Emissions:

Emission Factor: 5.5 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Calculations: 5.5 lb/MMScf * 1 MMScf/520 MMBtu * 1.35 MMBtu/hr = 0.01 lb/hr
0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.06 ton/yr

SO₂ Emissions:

Emission Factor: 0.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Calculations: 0.6 lb/MMScf * 1 MMScf/520 MMBtu * 1.35 MMBtu/hr = 0.0016 lb/hr
0.0016 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.01 ton/yr

HAP Emissions:

Emission Factor: 1.88 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98 (*sum of all HAPs listed))
Calculations: 1.88 lb/MMScf * 1 MMScf/520 MMBtu * 1.35 MMBtu/hr = 0.0049 lb/hr
0.0049 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.02 ton/yr

2.5 MMBtu/hr Heater Treaters (4-HT)

Fuel Consumption: 2.5 MMBtu/hr
Fuel Heating Value: 520 MMBtu/MMScf

PM Emissions (PM emissions include PM₁₀ and PM_{2.5}):

Emission Factor: 7.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Calculations: $7.6 \text{ lb/MMScf} * 1 \text{ MMScf/520 MMBtu} * 2.5 \text{ MMBtu/hr} = 0.04 \text{ lb/hr}$
 $0.04 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.16 \text{ ton/yr}$

NO_x Emissions:

Emission Factor: 100 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Calculations: $100 \text{ lb/MMScf} * 1 \text{ MMScf/520 MMBtu} * 2.5 \text{ MMBtu/hr} = 0.48 \text{ lb/hr}$
 $0.48 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 2.11 \text{ ton/yr}$

CO Emissions:

Emission Factor: 84 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Calculations: $84 \text{ lb/MMScf} * 1 \text{ MMScf/520 MMBtu} * 2.5 \text{ MMBtu/hr} = 0.40 \text{ lb/hr}$
 $0.40 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 1.77 \text{ ton/yr}$

VOC Emissions:

Emission Factor: 5.5 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)
Calculations: $5.5 \text{ lb/MMScf} * 1 \text{ MMScf/520 MMBtu} * 2.5 \text{ MMBtu/hr} = 0.03 \text{ lb/hr}$
 $0.03 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.12 \text{ ton/yr}$

SO₂ Emissions:

Emission Factor: 0.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)
Calculations: $0.6 \text{ lb/MMScf} * 1 \text{ MMScf/520 MMBtu} * 2.5 \text{ MMBtu/hr} = 0.0029 \text{ lb/hr}$
 $0.0029 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.01 \text{ ton/yr}$

HAP Emissions:

Emission Factor: 1.88 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98 (*sum of all HAPs listed))
Calculations: $1.88 \text{ lb/MMScf} * 1 \text{ MMScf/520 MMBtu} * 2.5 \text{ MMBtu/hr} = 0.009 \text{ lb/hr}$
 $0.009 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.04 \text{ ton/yr}$

Emergency Flare Pit (5-EF)

Maximum Gas Rate:	785 MScf/day or 32,708 Scf/hr	(Company Information)
Hours of Operation:	135 hr/yr	(Requested to limit SO ₂ below modeling threshold)
Fuel Gas Heating Value:	1,140 Btu/Scf or 36.5574 MMBtu/hr	(Company Information)
Density of Air:	0.078	(average of at STP and 59° F)
VOC Weight %:	25.46	(Gas Analysis)
Efficiency:	98%	(AP-42, Chapter 13)
Gas Usage (Combusted):	$32,708 \text{ Scf/hr} * 0.98 = 32,054 \text{ Scf/hr}$	
Gas not combusted:	$32,708 \text{ Scf/hr} * 0.02 = 654.16 \text{ Scf/hr}$	

Combusted Gas

PM Emissions (Soot)

Emission Factor: 0.000011 lb/Scf (AP-42, Chapter 13, Table 5-1, 1/95)
Calculations: $0.000011 \text{ lb/Scf} * 32,054 \text{ Scf/hr} * 135 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.02 \text{ ton/yr}$

NO_x Emissions

Emission Factor: 0.138 lb/MMBtu (Chemical Manufacturers Association (CMA), Flare Study)
Calculations: $0.138 \text{ lb/MMBtu} * 36.5574 \text{ MMBtu/hr} * 135 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.34 \text{ ton/yr}$

CO Emissions

Emission Factor: 0.2755 lb/MMBtu (CMA Flare Study)
Calculations: $0.2755 \text{ lb/MMBtu} * 36.5574 \text{ MMBtu/hr} * 135 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.68 \text{ ton/yr}$

SO_x Emissions

Emission Factor: 0.02252 lb/Scf (Company Information (based on 15.2522 weight % H₂S))
 $0.02252 \text{ lb/Scf} * 32,054 \text{ Scf/hr} * 135 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 48.73 \text{ ton/yr}$

Non-combusted Gas

VOC Emissions

Calculations: $654.16 \text{ Scf/hr} * 0.078 \text{ lb/Scf} * 1.007 = 51.38 \text{ lb/hr}$
 $51.38 \text{ lb/hr} * 135 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 3.47 \text{ ton/yr}$
 $3.47 \text{ ton/yr} * 25.46 / 100 = 0.88 \text{ ton/yr}$

HAP Emissions

HAP Emission Rate: 0.00 lb/yr (Gas Analysis)

H₂S Emissions

H₂S Emission Rate: 5.55 lb/hr (Gas Analysis)
 $5.55 \text{ lb/hr} * 135 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.37 \text{ ton/yr}$

1,000-bbl Working Oil Tank (6-OT)

Permit Limitation – 450 bbl/day (Requested by Company)
Control efficiency estimated to be 98% for Vapor Recovery Unit (Company Information)

VOC Emissions:

Standing and working losses
VOC Emission Rate: 5,313.28 lb/yr (EPA Tanks Emission Estimation Program v. 4.0)
 $5,313.28 \text{ lb/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.05 \text{ ton/yr}$

Flashing losses
VOC Emission Rate: 140.20 lb/hr (HYSIS Flash Emission Estimation Program v.3.1)
 $140.20 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 12.28 \text{ ton/yr}$

Total losses = 0.05 ton/yr + 12.28 ton/yr = 12.33 ton/yr

HAP Emissions:

Standing and working losses
HAP Emission Rate: 0.001 lb/hr (HYSIS Flash Emission Estimation Program v.3.1)
 $0.001 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.0001$

Flashing losses
HAP Emission Rate: 0.14 lb/hr (HYSIS Flash Emission Estimation Program v.3.1)
 $0.14 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.0123 \text{ ton/yr}$

Total losses = 0.0001 + 0.0123 = 0.0124

H₂S Emissions

H₂S Emission Rate: 2.18 lb/hr (HYSIS Flash Emission Estimation Program V.3.1)
 $2.18 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.19 \text{ ton/yr}$

1,000-bbl Bad Oil Tank (7-BT)

VOC Emissions:

Standing and working losses

VOC Emission Rate: 1,005.23 lb/yr (EPA Tanks Emission Estimation Program v. 4.0)
 $1,005.23 \text{ lb/yr} * 0.0005 \text{ ton/lb} = 0.50$

Flashing losses: No flash emissions result from this tank

Total losses = 0.50 ton/yr + 0.00 ton/yr = 0.50

HAP Emissions:

Standing and working losses

HAP Emission Rate: 0.00 lb/yr (Gas Analysis)

300-bbl Emergency Pop Tank (11-PT)

VOC Emissions:

Emergency Venting

Production Vessels Gas Stream

Gas Volume: 75000 Scf/day or 3,125 Scf/hr (Company Information)
Gas Specific Gravity: 1.077 (Company Information)
Hours of Operation: 475 hr/yr (Requested to limit VOC below 100 ton/yr)
Density of Air: 0.078 lb/Scf (average of at STP and 59° F)
VOC Weight %: 36.42 (Gas Analysis)

Calculations: $3125 \text{ Scf/hr} * 0.078 \text{ lb/Scf} * 1.077 = 262.52 \text{ lb/hr}$
 $262.52 \text{ lb/hr} * 475 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 62.35 \text{ ton/yr}$
 $62.35 \text{ ton/yr} * 36.42 / 100 = 22.71 \text{ ton/yr}$

Oil Production Flash Gas Stream

Gas Volume: 40,000 Scf/day or 1,667 Scf/hr (Company Information)
Gas Specific Gravity: 1.285 (Company Information)
Hours of Operation: 475 hr/yr (Requested to limit VOC below 100 ton/yr)
Density of Air: 0.078 lb/Scf (average of at STP and 59° F)
VOC Weight %: 71.33 (HYSIS Flash Emission Estimation Program V.3.1)

Calculations: $1667 \text{ Scf/hr} * 0.078 \text{ lb/Scf} * 1.285 = 167.08 \text{ lb/hr}$
 $167.08 \text{ lb/hr} * 475 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 39.68 \text{ ton/yr}$
 $39.68 \text{ ton/yr} * 71.33 / 100 = 28.30 \text{ ton/yr}$

Total losses = 22.71 ton/yr + 28.30 ton/yr = 51.01 ton/yr

HAP Emissions:

Emergency Venting

Production Vessels Gas Stream

HAP Emission Rate: 0.00 lb/yr (Gas Analysis)

Oil Production Flash Gas Stream

Gas Volume:	40,000 Scf/day or 1,667 Scf/hr	(Company Information)
Gas Specific Gravity:	1.285	(Company Information)
Hours of Operation:	475 hr/yr	(Requested to limit VOC below 100 ton/yr)
Density of Air:	0.078 lb/Scf	(average of at STP and 59° F)
HAP Weight %:	0.07	(HYSIS Flash Emission Estimation Program V.3.1)

Calculations: $1667 \text{ Scf/hr} * 0.078 \text{ lb/Scf} * 1.285 = 167.08 \text{ lb/hr}$
 $167.08 \text{ lb/hr} * 475 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 39.68 \text{ ton/yr}$
 $39.68 \text{ ton/yr} * 0.07 / 100 = 0.03 \text{ ton/yr}$

Total losses = 0.00 ton/yr + 0.03 ton/yr = 0.03

H₂S Emissions

Emergency Venting

Production Vessels Gas Stream

H ₂ S Emission Rate:	10.29 lb/hr	(Gas Analysis)
	$10.29 \text{ lb/hr} * 475 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 2.44 \text{ ton/yr}$	

Oil Production Flash Gas Stream

H ₂ S Emission Rate	1.85 lb/hr	(HYSIS Flash Emission Estimation Program V.3.1)
	$1.85 \text{ lb/hr} * 475 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.44 \text{ ton/yr}$	

Total Losses = 2.44 ton/yr + 0.44 ton/yr = 2.88 ton/yr

Fugitive Emissions – Piping (12-FE)

VOC Emissions

Basis for Emission Factors: EPA Protocol for Equipment Leak Emission Estimates, November 1995 (EPA-453/R-95-017)

VOC Weight %:	63.1	(Gas Analysis)
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Connector (Oil):	241 components in light oil service (≥ 20 API Gravity)
Emission Factor:	0.000210 kg/hr - component or 0.0111 lb/day - component
Calculation:	$241 \text{ components} * 0.0111 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.49 \text{ ton/yr}$ $0.49 \text{ ton/yr} * 63.1 / 100 = 0.31 \text{ ton/yr}$

Connector (Gas):	232 components in light oil service (≥ 20 API Gravity)
Emission Factor:	0.0002 kg/hr - component or 0.0106 lb/day - component
Calculation:	$232 \text{ components} * 0.0106 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.45 \text{ ton/yr}$ $0.45 \text{ ton/yr} * 63.1 / 100 = 0.28 \text{ ton/yr}$

Total connector emissions (Oil & gas) = 0.31 ton/yr + 0.28 ton/yr = 0.59 ton/yr

Flange (Oil):	99 components in light oil service (≥ 20 API Gravity)
Emission Factor:	0.00011 kg/hr - component or 0.0058 lb/day - component
Calculation:	$99 \text{ components} * 0.0058 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.11 \text{ ton/yr}$ $0.11 \text{ ton/yr} * 63.1 / 100 = 0.07 \text{ ton/yr}$

Flange (Gas):	38 components in light oil service (≥ 20 API Gravity)
Emission Factor:	0.00039 kg/hr - component or 0.0206 lb/day - component
Calculation:	$38 \text{ components} * 0.0206 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.14 \text{ ton/yr}$ $0.14 \text{ ton/yr} * 63.1 / 100 = 0.09 \text{ ton/yr}$

Total flange emissions (Oil & gas) = 0.07 ton/yr + 0.09 ton/yr = 0.16 ton/yr

Open-Ended Lines (Oil): 9 components in light oil service (≥ 20 API Gravity)
Emission Factor: 0.0014 kg/hr - component or 0.0741 lb/day - component
Calculation: $9 \text{ components} * 0.0741 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.12 \text{ ton/yr}$
 $0.12 \text{ ton/yr} * 63.1 / 100 = 0.08 \text{ ton/yr}$

Open-Ended Lines (Gas): 8 components in light oil service (≥ 20 API Gravity)
Emission Factor: 0.002 kg/hr - component or 0.1058 lb/day - component
Calculation: $8 \text{ components} * 0.1058 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.16 \text{ ton/yr}$
 $0.16 \text{ ton/yr} * 63.1 / 100 = 0.10 \text{ ton/yr}$

Total open-ended line emissions (Oil & gas) = 0.08 ton/yr + 0.10 ton/yr = 0.18 ton/yr

Pumps (Oil): 3 components in light oil service (≥ 20 API Gravity)
Emission Factor: 0.013 kg/hr - component or 0.6878 lb/day - component
Calculation: $3 \text{ components} * 0.6878 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.38 \text{ ton/yr}$
 $0.38 \text{ ton/yr} * 63.1 / 100 = 0.24 \text{ ton/yr}$

Pumps (Gas): 0 components in light oil service (≥ 20 API Gravity)
Emission Factor: 0.0024 kg/hr - component or 0.127 lb/day - component
Calculation: $0 \text{ components} * 0.127 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.00 \text{ ton/yr}$
 $0.00 \text{ ton/yr} * 63.1 / 100 = 0.00 \text{ ton/yr}$

Total pump emissions (Oil & gas) = 0.24 ton/yr + 0.00 ton/yr = 0.24 ton/yr

Valves (Oil): 80 components in light oil service (≥ 20 API Gravity)
Emission Factor: 0.0025 kg/hr - component or 0.1323 lb/day - component
Calculation: $80 \text{ components} * 0.1323 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 1.93 \text{ ton/yr}$
 $1.93 \text{ ton/yr} * 63.1 / 100 = 1.22 \text{ ton/yr}$

Valves (Gas): 50 components in light oil service (≥ 20 API Gravity)
Emission Factor: 0.0045 kg/hr - component or 0.2381 lb/day - component
Calculation: $50 \text{ components} * 0.2381 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 2.17 \text{ ton/yr}$
 $2.17 \text{ ton/yr} * 63.1 / 100 = 1.37 \text{ ton/yr}$

Total valve emissions (Oil & gas) = 1.22 ton/yr + 1.37 ton/yr = 2.59 ton/yr

Others (Oil): 4 components in light oil service (≥ 20 API Gravity)
Emission Factor: 0.0075 kg/hr - component or 0.3968 lb/day - component
Calculation: $4 \text{ components} * 0.3968 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.29 \text{ ton/yr}$
 $0.29 \text{ ton/yr} * 63.1 / 100 = 0.18 \text{ ton/yr}$

Others (Gas): 5 components in light oil service (≥ 20 API Gravity)
Emission Factor: 0.0088 kg/hr - component or 0.4656 lb/day - component
Calculation: $5 \text{ components} * 0.4656 \text{ lb/day-component} * 365 \text{ day/yr} * 0.0005 \text{ ton/lb} = 0.42 \text{ ton/yr}$
 $0.42 \text{ ton/yr} * 63.1 / 100 = 0.27 \text{ ton/yr}$

Total other emissions (Oil & gas) = 0.18 ton/yr + 0.27 ton/yr = 0.45 ton/yr

Total fugitive emissions – piping (12-FE) = 0.59 ton/yr + 0.16 ton/yr + 0.18 ton/yr + 0.24 ton/yr +
2.59 ton/yr + 0.45 ton/yr = 4.21 ton/yr

HAP Emissions

Basis for Emission Factors: EPA Protocol for Equipment Leak Emission Estimates, November 1995 (EPA-453/R-95-017)

HAP	Speciation Factor (% HAP in vapor phase)	VOC Emissions (ton/yr)	Control Efficiency (%)	HAP Emissions (ton/yr)
Benzene	0.0054	4.21	0	0.0227
Toluene	0.0559	4.21	0	0.2353
Ethylbenzene	0.0073	4.21	0	0.0307
Xylene	0.0089	4.21	0	0.0375
Tolulene	0.0303	4.21	0	0.1276
Total HAPs from fugitives				0.4538 ton/yr

H₂S Emissions

Calculation: $0.13 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.57 \text{ ton/yr}$ (HYSIS Flash Emission Estimation Program V.3.1)

VOC Emissions

Fuel Consumption Rate:	0.2 Scf/min or 12 Scf/hr	(Company Information (EPA Estimate))
Gas Specific Gravity:	0.8586	(Gas Analysis)
Density of Air:	0.078	(average of at STP and 59° F)
# of Pneumatic Devices:	13	(Company Information)
VOC Weight %:	1.09	(Gas Analysis)

Calculation: $12 \text{ Scf/hr/device} * 0.078 \text{ lb/Scf} * .8586 * 13 \text{ device} = 10.45 \text{ lb/hr}$
 $10.45 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 45.77 \text{ ton/yr}$
 $45.77 \text{ ton/yr} * 1.09 / 100 = 0.49 \text{ ton/yr}$

Hap Emissions

0 % Haps based on analysis of the fuel gas from the Elk Basin Gas Plant

V. Existing Air Quality

The Encore facility is located in eastern Montana in a sparsely populated area with generally very good ventilation throughout the year. The legal description of the facility is Section 35, Township 9 South, Range 23 East, in Carbon County, Montana. Carbon County is unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants.

VI. Ambient Air Impact Analysis

The Department determined, based on the relatively small amount of emissions and the existing air quality in the area, that the impact from this permitting action will be minor. The Department believes that the Encore facility will not cause or contribute to a violation of any ambient air quality standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Environmental Assessment

This permitting action will not result in an increase of emissions from the facility and is considered an administrative action; therefore, an Environmental Assessment is not required.

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